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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/595,403

**Applicant(s)**

DERUGINSKY ET AL.

**Examiner**

GEORGE C. MONIKANG

**Art Unit**

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13-15, 17-22, 24, 25 and 28-34 is/are rejected.
- 7) ☒ Claim(s) 11-12, 16, 23, 26-27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 10/595,403.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/19/2009 has been entered.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1-2, 10, 13-15, 17-18, 21-22, 29 & 32-34 is rejected under 35 U.S.C. 102(e) as being anticipated by Van Der Zwan et al, US Patent 7489791 B2.

Re Claim 1, Van Der Zwan et al discloses a microphone preamplifier, comprising a semiconductor substrate (*col. 2, lines 50-53: integrated circuits are realized as semiconductor devices*), a differential input stage with a first signal input terminal (*fig. 4: Acom; col. 4, lines 25-32: common mode amplifier*) and a second signal input terminal

*(fig. 4: Acom; col. 4, lines 25-32: common mode amplifier)* and output stage with an output terminal *(fig. 4: Acom; col. 4, lines 25-32: common mode amplifier)*; wherein a signal from a microphone is to be applied to the second signal input terminal and a feedback circuit *(fig. 4: 1, LPF feedback; col. 2, lines 14-19: the output of the microphone is submitted into the second input terminal of the amplifier and eventually to the feedback circuit LPF)*, having a low pass frequency transfer function *(fig. 4: LPF feedback; col. 2, lines 14-19)* coupled between the output terminal and the first signal input terminal *(fig. 4: 1, LPF feedback; col. 2, lines 14-19: the output of the microphone is submitted into the second input terminal of the amplifier and eventually to the feedback circuit LPF which sends its signals back to the input terminals)*; and a DC offset implemented in the feedback circuit to set the DC bias voltage at the output terminal *(col. 4, lines 1-6)*.

Re Claim 2, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the input, stage comprises an inverting input and a non-inverting input *(fig. 4: Acom; col. 4, lines 25-32: common mode amplifier has an inverting and non-inverting input)* wherein the non-inverting input is the second input terminal arranged to receive the microphone signal *(fig. 4: Acom; col. 4, lines 25-32: common mode amplifier has an inverting and non-inverting input)*, and the inverting input is the first input signal terminal arranged to receive a feedback signal provided by the feedback circuit *(fig. 4: Acom; col. 4, lines 25-32: common mode amplifier has an inverting and non-inverting input)*.

Re Claim 10, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the feedback circuit is configured with an active device which provides an ohmic impedance across a two-port circuit (fig. 4: LPF feedback; col. 2, lines 14-19).

Re Claim 13, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the feedback circuit comprises a source providing a DC offset (col. 4, lines 1-6).

Re Claim 14, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the feedback circuit comprises a filter (fig. 4: LPF feedback; col. 2, lines 14-19) with a source that provides a DC offset (col. 4, lines 1-6).

Re Claim 15, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the DC offset is provided at the first signal input by a circuit configuration comprising a current source coupled, at the circuit node of the first signal input (col. 2, lines 43-53), to an active device which provides an ohmic impedance across a two-port circuit (col. 2, lines 43-53).

Re Claim 17, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the differential input stage comprises a first and second current path for the respective differential inputs (col. 2, lines 43-53), and wherein a DC offset is provided by establishing different DC currents through the first and second current path of the differential input stage (col. 2, lines 43-53).

Re Claim 18, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the preamplifier is configured to receive the microphone signal via

an input bias element which has relatively high ohmic impedance when the microphone signal is relatively small in magnitude and relatively low ohmic impedance when the microphone signal is relatively high in magnitude (AAPA, col. 2, lines 1-17).

Claim 21 has been analyzed and rejected according to claim 1.

Re Claim 22, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the preamplifier is a differential amplifier which is configured to convert an input signal into a common mode signal for low frequencies and into a differential for audio frequencies (fig. 4: Acom; col. 4, lines 25-32: common mode amplifier).

Re Claim 29, Van Der Zwan et al discloses a microphone according to claim 1, comprising an electret microphone configured to provide a microphone signal, responsive to a sound pressure on the electret microphone, to the microphone preamplifier (col. 2, line 66 through col. 3, line 11).

Claim 32 has been analyzed and rejected according to claim 1.

Re Claim 33, Van Der Zwan et al discloses the microphone preamplifier as claimed in claim 1 wherein said differential amplifier has a high pass frequency transfer function (fig. 4: LPF feedback; col. 2, lines 14-19: low pass filter feedback is needed to compensate for high frequency components of the differential amplifier) and said feedback circuit low-pass frequency transfer function reduces the low frequency output of the preamplifier (fig. 4: LPF feedback; col. 2, lines 14-19).

Claim 34 has been analyzed and rejected according to claim 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-9, 20, 25, 28 & 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Zwan et al, US Patent 7489791 B2.

Re Claim 8, which further recites, "Wherein the feedback circuit is an active filter." Van Der Zwan et al does not explicitly disclose an active filter as claimed. Official notice is taken that both the concepts and advantages of providing an active filter are well known in the art. It would have been obvious to use an active filter since it is commonly used to shape the filter's response and buffer the filter from the electronic components it drives.

Re Claim 9, which further recites, "Wherein the feedback circuit is a passive filter." Van Der Zwan et al does not explicitly disclose a passive filter as claimed. Official notice is taken that both the concepts and advantages of providing a passive filter are well known in the art. It would have been obvious to use a passive filter since it is commonly used to block low frequency signals and cause them to go through the load.

Re Claim 20, which further recites, "Wherein the bias element is configured by two cross-coupled bipolar transistors." Van Der Zwan et al does not explicitly disclose

Bipolar transistors as claimed. Official notice is taken that both the concepts and advantages of providing bipolar transistors are well known in the art. It would have been obvious to use bipolar transistors since it is commonly used in amplifying and switching applications.

Re Claim 25, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, but fails to disclose wherein a phase shifter is coupled between inputs of the differential amplifier. However, official notice is taken that both the concepts and advantages of using a phase shifter are well known in the art. Therefore it would have been obvious for Van Der Zwan et al to incorporate a phase shifter within their integrated circuit for the purpose of matching the phases of the microphone signals.

Re Claim 28, which further recites, "Comprising a voltage pump integrated on the semiconductor substrate." Van Der Zwan et al does not explicitly disclose a voltage pump as claimed. Official notice is taken that both the concepts and advantages of providing a voltage pump are well known in the art. It would have been obvious to use a voltage pump since they are commonly used to increase the reference voltage to a bias voltage.

Re Claim 31, which further recites, "Comprising a MEMS microphone member to provide a microphone signal, responsive to a sound pressure on the MEMS microphone, to the microphone preamplifier." Official notice is taken that both the concepts and advantages of providing a MEMS microphone is well known in the art. It would have been obvious to use a MEMS microphone since they are small in size and can withstand mechanical shocks.



***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Zwan et al, US Patent 7489791 B2, as applied to claim 1 above, in view of Tsinker, US Patent 6,150,875.

Re Claim 3, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the feedback circuit is a filter with a transfer function (fig. 4: LPF feedback; col. 2, lines 14-19), in the frequency domain (fig. 4: LPF feedback; col. 2, lines 14-19), but fails to disclose a zero and a pole; wherein the zero is located at a higher frequency than the pole. However, Tsinker does (Tsinker et al, col. 6, lines 31-42).

Taking the combined teachings of Van Der Zwan et al and Tsinker as a whole, one skilled in the art would have found it obvious to modify the microphone preamplifier according to claim 1, wherein the feedback circuit is a filter with a transfer function (fig. 4: LPF feedback; col. 2, lines 14-19), in the frequency domain (fig. 4: LPF feedback; col. 2, lines 14-19) of Van Der Zwan et al with a zero and a pole; wherein the zero is located at a higher frequency than the pole as taught in Tsinker (Tsinker, col. 6, lines 31-42) so that circuit could be more effective.

Re Claim 4, the combined teachings of Van Der Zwan et al and Tsinker disclose a microphone preamplifier according to claim 1, wherein the preamplifier has a transfer function, in the frequency domain, with a zero and a pole; wherein the pole is located in the range 0.1 Hz to 50 Hz or 0.1 Hz to 100 Hz or 0.1 to 200 Hz (Tsinker, col. 6, lines 31-42).

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Zwan et al, US Patent 7489791 B2, as applied to claim 1 above, in view of Bhandari et al, US Patent 6,424,480 B1.

Re Claim 5, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, wherein the feedback circuit is a filter which (fig. 4: LPF feedback; col. 2, lines 14-19), in the frequency domain (fig. 4: LPF feedback; col. 2, lines 14-19), but fails to disclose a relatively high gain level below a transition frequency range and a relatively low gain level above the transition frequency range. However, Bhandari et al does (col. 4, lines 8-15).

Taking the combined teachings of Van Der Zwan et al and Bhandari et al as a whole, one skilled in the art would have found it obvious to modify the microphone preamplifier according to claim 1, wherein the feedback circuit is a filter which (fig. 4: LPF feedback; col. 2, lines 14-19), in the frequency domain (fig. 4: LPF feedback; col. 2, lines 14-19) of Van Der Zwan et al with a relatively high gain level below a transition frequency range and a relatively low gain level above the transition frequency range as taught in Bhandari et al (Bhandari et al, col. 4, lines 8-15) to control the gain and feedback of the amplifier.

Re Claim 6, the combined teachings of Van Der Zwan et al and Bhandari et al disclose a microphone preamplifier according to claim 5, but fails to disclose wherein the transition frequency range is located below a frequency of about 100 Hz.

However, establishing a transition frequency range below 100 Hz is the inventor's preference thus it would have been obvious for Van Der Zwan et al and Bhandari to modify the transition frequency range below 100 Hz for the motivation of amplifying a low level signal with high frequency and low distortion.

Claim 7 has been analyzed and rejected according to claim 6.

Claims 19 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Zwan et al, US Patent 7489791 B2, and further in view of French et al, US Patent 5,337,011.

Re Claim 19, Van Der Zwan et al discloses a microphone preamplifier according to claim 18, but fails to disclose wherein the bias element is configured by two cross-

coupled diodes. However, French et al does (fig. 2: 36; col. 1, line 61 through col. 2, line 18).

Taking the combined teachings of Van Der Zwan et al and French et al as a whole, one skilled in the art would have found it obvious to modify the microphone preamplifier according to Van Der Zwan et al with wherein the bias element is configured by two cross-coupled diodes as taught in French et al (French et al, fig. 2: 36; col. 1, line 61 through col. 2, line 18) to reduce noise content.

Re Claim 30, Van Der Zwan et al discloses a microphone module according to claim 1, but fails to disclose wherein the electret microphone is mounted inside a space formed by a cartridge, and wherein the microphone preamplifier is integrated within the microphone module. However, French et al does (French, abstract).

Taking the combined teachings of Van Der Zwan et al and French et al as a whole, one skilled in the art would have found it obvious to modify the microphone module according to Van Der Zwan et al with wherein the electret microphone is mounted inside a space formed by a cartridge, and wherein the microphone preamplifier is integrated within the microphone module as taught in French et al (French et al, abstract) to reduce noise content.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Zwan et al, US Patent 7489791 B2, as applied to claim 1 above, in view of Huckins et al, US Patent 6,731,163 B2.

Re Claim 24, Van Der Zwan et al discloses a microphone preamplifier according to claim 1, but fails to disclose wherein a differential amplifier is configured to provide frequencies below an audio band as common mode signals and audio band signals as differential mode signals. However, Huckins et al does (Huckins et al, abstract: able to provide common mode and differential signals).

Taking the combined teachings of Van Der Zwan et al and Huckins et al as a whole, one skilled in the art would have found it obvious to modify the microphone preamplifier according to Van Der Zwan et al with wherein a differential amplifier is configured to provide frequencies below an audio band as common mode signals and audio band signals as differential mode signals as taught in Huckins et al (abstract: able to provide common mode and differential signals) to reduce the effect of compensation capacitance during differential mode operation.

#### ***Allowable Subject Matter***

Claims 11-12, 16, 23 & 26-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter for claim 11: The prior art does not teach or moderately suggest the following limitations:

The feedback circuit comprising a configuration with a first and a second active device and a current source, where the devices comprise a respective gate terminal, a

source terminal and a drain terminal, and where the gate terminals are interconnected at a node connected to the current source and the drain terminal of the first device, and where the source terminals are interconnected, to provide the second device in a state where an ohmic resistance is provided between its drain and source terminal.

Limitations such as these may be useful in combination with other limitations of claim 1.

The following is a statement of reasons for the indication of allowable subject matter for claim 12: The prior art does not teach or moderately suggest the following limitations:

The feedback circuit comprising a filter with an input port connected to a series connection of a first and second resistor which forms a resistor node at their interconnection, and connected to a series connection of a first and second capacitor which forms a capacitor node at their interconnection; and an output port at the capacitor node; wherein the resistor node and capacitor node are interconnected by an active device which provides an ohmic impedance across a two-port circuit.

Limitations such as these may be useful in combination with other limitations of claim 1.

The following is a statement of reasons for the indication of allowable subject matter for claim 23: The prior art does not teach or moderately suggest the following limitations:

A differential amplifier is configured as an instrumentation type amplifier with two inputs and a first and a second output, where the first and second input are arranged to

receive a microphone signal, and the inputs are coupled to receive the microphone signals substantially in phase at relatively low frequencies and substantially out of phase at relatively high frequencies.

Limitations such as these may be useful in combination with other limitations of claim 1.

The following is a statement of reasons for the indication of allowable subject matter for claim 26: The prior art does not teach or moderately suggest the following limitations:

A phase shifter cross coupled between an output of one side of the differential amplifier and an input of the opposite side of the differential amplifier.

The following is a statement of reasons for the indication of allowable subject matter for claim 27: The prior art does not teach or moderately suggest the following limitations:

A phase shifter coupled between a signal node, in phase with an input signal to the amplifier, and an input terminal of an opposite side of the differential amplifier.

Claim 16 has been analyzed and treated according to claim 11.

#### **Contact**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE C. MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on M-F. alt Fri. Off 7:30am-5:00pm (est).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George C Monikang/  
Examiner, Art Unit 2614

6/19/2009

**/Vivian Chin/**  
**Supervisory Patent Examiner, Art Unit 2614**